

Amendments to the Drawings:

The attached sheet of drawings includes proposed changes to Fig. 4 necessary to bring Fig. 4 into line with the invention as described within the specification. Upon approval by the Examiner of changes to Fig. 4, a new replacement formal drawing of Fig. 4 will be provided.

Attachment: Annotated sheet showing proposed changes to Fig. 4

REMARKS/ARGUMENTS

Claims 1-7 remain in this application.

This Amendment is submitted in response to the Official Letter dated August 16, 2004. Favorable reconsideration of the application is respectfully requested.

1. Amendment to Specification

In the specification, the paragraph beginning on page 6, line 34 and ending on page 7, line 2 has been amended to clarify the definition of axial rake angle, a common term used in the art.

2. The Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p) (5) because they include the following reference character(s) not mentioned in the description: "Y" in Fig. 4.

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "the axial rake angle of the inserts varies between flutes, and within each flute to provide single all effective cutting" (in claim 1) must be shown or the feature(s) cancelled from the claim(s). No new matter should be entered. Note in Fig. 4, there is a gap "Y" in axial direction between the adjacent inserts. The arrangement of the insert cannot provide single all effective cutting as claimed.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application.

A revised Figure 4 is submitted for approval and removes the description "Y" as suggested. The revision to Fig. 4 as proposed presents no new matter and the acceptance of revised Fig. 4 is respectfully requested.

3. Section 112, 2nd Paragraph, Rejection of Claim 5

Claim 5 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action provides:

"In claim 5, line 3, it is not clear what is the definition of "adjacent inserts" since the direction of the relative location of the inserts was not well defined. Further, in lines 2-3, how could "the actual lengths of adjacent inserts in any flute do not circumferentially overlap" provide single all effective cutting as described in claim 1?"

Claim 5 has been amended to read “adjacent inserts in any single flute” to add clarity to the intended reference to adjacent inserts within the same flute. It is also respectfully submitted that “the actual lengths of adjacent inserts in any flute do not circumferentially overlap” has no bearing on the existence or non-existence of a single all effective cutting edge as described in claim 1. Axial overlap of the cutting edge portion of adjacent inserts is the required property to ensure a single all effective cutting edge. The lack of circumferential overlap as indicated in claim 5 lends description to the circumferential spacing of the adjacent inserts and poses no obstacle to providing a single all effective cutting edge. For at least the foregoing reasons, withdrawal of the objection is respectfully requested.

4. Section 112, 2nd Paragraph, Rejection of Claim 6

Claims 6 stands rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Office Action provides:

“In claim 6, line 2, how could “the cutting edges on adjacent inserts in any flute do not circumferentially overlap” provide single all effective cutting as described in claim 1?”

As previously mentioned, circumferential overlap or lack thereof has no effect on the existence of a single all effective cutting edge. It is also noted that Claim 6 has been amended to add clarity to the reference to “adjacent inserts” as was done in Claim 5. For at least the foregoing reasons, withdrawal of the objection is respectfully requested.

5. Section 103(a) Rejection of Claims 1, 2, 6 and 7

Claims 1, 2, 6 and 7 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tsujimura et al. (US Pat # 4,844,666) in view of Dotany (US Pat # 5,083,887) . The Office Action provides:

“Referring to claim 1, Tsujimura et al. discloses the claimed invention comprising, a tool body having an outer surface thereon and a central axis therein and including at least a first (including 24a, see Fig. 15) and second (including 24b, see Fig. 15) spiraling flute in the outer surface, each flute including a plurality of inserts (24a, 24b, see Fig. 15) secured therein to define an axial rake angle, wherein the axial rake angle of the inserts (24a, 24b, see Fig. 15) varies between flutes (e.g., changing from a1 to a4) , and within each flute (changing from a1, a2, to a3 for the flute having inserts 24a, see Fig. 15) to provide all effective cutting. Note the combination of the cutting flutes as shown in Fig. 15 provides all effective cutting.”

Note Tsujimura et al. also discloses the limitations described:

in claim 2, all of the inserts (24a, 24b, see Fig. 15) on the entire tool body being identical;

in claim 6, the cutting edges on adjacent inserts (such as 24a, 24a, see Fig. 15) in any flute do not circumferentially overlap; and

in claim 7, the inserts (24a, 24b, see Fig. 15) each having a cutting edge and the cutting edges on inserts with differing axial rake angles have differing cutting edge lengths (see Fig. 15).

Tsujimura et al. discloses the claimed invention except for: providing single flute all effective cutting.

Dotany discloses a helical cutting tool comprising the flute to provide single flute all effective cutting (see Fig. 1, and Col. 4, lines 14-16, regarding the overlapping relation in the axial direction indicated by dimension "A" as shown in Fig. 1)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsujimura et al.'s tool to comprise the flute providing single flute all-effective cutting, as taught by Dotany, in order to have a continuous, non-interrupted cutting line to facilitate the smooth cutting process and chip removal for the Tsujimura et al.'s tool."

To establish a *prima facie* case of obviousness, three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the applied reference must teach or suggest all the claim limitations (See MPEP §2143).

It is respectfully submitted that the Office Action does not meet the criteria for establishing a *prima facie* case of obviousness.

Neither Tsujimura or Dotany teach or suggest the rake angle of the inserts varying between flutes and within each flute to provide single flute all effective cutting. Tsujimura appears to teach varying axial rake angles of inserts within and between flutes, it clearly does not teach or suggest single flute all effective cutting.

To overcome the deficiencies of Tsujimura, the Examiner has relied upon the teachings of Dotany. Although Dotany appears to teach single flute all effective cutting, Dotany produces single flute all effective cutting by utilizing identical inserts having identical axial rakes within and between flutes. There is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Tsujimura with the teachings of Dotany. On the contrary, Dotany appears to teach away from Tsujimura and the claimed invention. Dotany specifically teaches that "the

cutting edges of the cutting inserts form an inclination angle of 8-12 degrees with respect to the longitudinal axis of the tool; preferably, the inclination angle is approximately 10 degrees", i.e., Dotany teaches that the rake angles do not vary between flutes and within each flute.

It is respectfully submitted that one skilled in the art would not be inclined to modify Tsujimura as taught by Dotany. For at least these reasons, Claim 1 is allowable over the applied art. Claims 2, 6 and 7 depend from Claim 1 and are likewise allowable over the applied art for at least the same reasons described above for Claim 1. Withdrawal of the rejection is respectfully requested.

6. Section 103(a) Rejection of Claims 3-5

Claims 3-5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Tsujimura et al.'666 in view of Dotany '887 as applied to claims 1,2,6, and 7, and further in view of Dutschke et al '603. The Office Action provides:

"Tsujimura et al. '666 in view of Dotany '877 discloses the claimed invention except for: the tool body including three spiraling flutes (in claim 3).

Dutschke et al. discloses a cutting insert comprising the tool body including three spiraling flutes (18, see Figs. 3a, 3b).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Tsujimura et al.'666/Dotany'887's tool to comprise the tool body including three spiraling flutes, as taught by Dutschke et al.'603, since it is just an alternative flute arrangement comparing with the structure of the Tsujimura et al.'666/Dotany'887's tool.

As to claim 4, Tsujimura et al.'666/Dotany'887 also discloses: all of the inserts (24a, 24b in Tsujimura et al.'666 and 4, 4 in Dotany'887) on the entire tool body being identical."

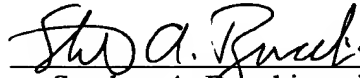
Claims 3-5 depend from Claim 1 and are believed to be in condition for allowance for at least the same reasons as Claim 1 described above. For at least these reasons, Claims 3-5 are allowable over the applied art. Withdrawal of the rejection is respectfully requested.

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7. **Conclusion**

In view of the amendments and above remarks, it is believed that the application is in condition for allowance. Accordingly, an early Notice Of Allowance is respectfully requested.

Respectfully submitted,



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